

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently amended) A reaction apparatus comprising a heat exchanger and a reactor with a heater, which are enclosed in an outer casing;

wherein the heat exchanger has a first end and a second end, whereby the first end of the heat exchanger being connected to the reactor and the second end of the heat exchanger and only a bottom of the outer casing being fixed to each other by a flange and a double piping having an inner tube and an outer tube, for introducing a gas to be treated and for discharging the treated gas, wherein the double piping is being connected to the second end of the heat exchanger, such that gas passes through the heat exchanger-5, the reactor-1 and the heat exchanger-5 in this order during a process from introducing gas through one of the inner tube and the outer tube in the double piping to discharging the gas through the other tube of the inner tube and the outer tube.
2. (previously presented): The reaction apparatus as claimed in claim 1, wherein the heat exchanger is a shell and tube-type heat exchanger.
3. (previously presented): The reaction apparatus as claimed in claim 1, wherein the outer casing has an eyebolt fixing part for detachably engaging the outer casing to the reactor.
4. (previously presented): The reaction apparatus as claimed in claim 1, wherein the reactor has fins in the inside thereof.

5. (previously presented): The reaction apparatus as claimed in claim 1, wherein at least one fin is provided inside the inner tube in the double piping and/or between the inner tube and the outer tube in the double piping.

6. (previously presented): The reaction apparatus as claimed in claim 1, comprising a mechanism where the gas to be treated is introduced through the inner tube and discharged through the outer tube.

7. (previously presented): The reaction apparatus as claimed in claim 6, wherein the outer tube of the double piping has a heat radiating plate.

8. (previously presented): The reaction apparatus as claimed in claim 1, wherein the reaction apparatus is adapted to be installed horizontally and the reactor with a heater and the heat exchanger are placed horizontally with respect to each other.

9. (previously presented): A reaction method comprising the steps of:
introducing a gas to a double piping, wherein the double piping has an inner tube and an outer tube;
passing the gas to be treated sequentially into one tube of the inner tube and the outer tube in the double piping, a heat exchanger, a reactor with a heater, the heat exchanger and the other tube of the inner tube and the outer tube in the double piping in this order; and

heating the gas to be treated by the heater before the gas to be treated is introduced into the reactor, thereby adjusting temperature difference in a gas flow direction inside the reactor.

10. (previously presented): The reaction method as claimed in claim 9, wherein the gas to be treated is introduced through the inner tube of the double piping and discharged through the outer tube.

11. (Original) The reaction method as claimed in claim 9 or 10, wherein the temperature difference is adjusted to 50°C or less.